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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,301	12/30/2003	Xing Su	070702007400	1668

7590 10/05/2006

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EXAMINER

YU, MELANIE J

ART UNIT	PAPER NUMBER
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1641

DATE MAILED: 10/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/750,301

Applicant(s)

SU ET AL

Examiner

Melanie Yu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12, 33 and 34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 33 and 34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 17 July 2006 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
2. Claims 1-5, 7-12, 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farquharson et al. (US 6,943,031) in view of Takagi et al. (US 4,654,132) further in view of Schultz et al. (US 6,180,415).

Farquharson et al. teach a gel matrix comprising a gel comprising pores having a size to sieve molecules of a desired range (col. 2, lines 55-65) and one or more SERS-enhancing nanoparticles stationary within the gel (col. 3, lines 30-35); a sample containing

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at least one analyte (col. 2, lines 58-62); and an optical detection system suitable for detecting SERS signals from the nanoparticles (col. 3, lines 35-43). Farquharson et al. fail to teach the gel sieving molecules by electrophoresis or the nanoparticles having an attached probe that binds specifically to an analyte.

Takagi et al. teach a gel separating molecules by electrophoresis (col. 3, line 5-col. 4, line 21), in order to provide separation and purification of biomembrane proteins.

Shultz et al. teach SERS-enhancing nanoparticles having an attached probe that binds specifically to an analyte (PRP is a nanoparticles, col. 8, lines 25-27; and are SERS nanoparticles, col. 10, lines 14-26; target ligand is attached to nanoparticles, col. 23, lines 40-48 and 54-61), in order to provide bind and detect analyte.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the gel matrix of Farquharson et al., the gel capable of sieving molecules by electrophoresis as taught by Takagi et al., in order to provide a gel that is chemically stable, is not affected by change in pH or temperature and has a high level of reproducibility and to provide efficient means of sample separation. It would have further been obvious to one having ordinary skill in the art at the time the invention was made to include on the nanoparticles of Farquharson et al. in view of Takagi et al., an attached probe that binds specifically to an analyte as taught by Schultz et al., in order to improve accuracy and sensitivity of detection of analyte.

With respect to claims 2 and 5, Schultz et al. teach the gel matrix comprising a plurality of nanoparticles to provide a plurality of unique optical signatures (nanoparticles are in the gel matrix and properties of nanoparticles are described at col. 3, lines 28-36; col. 5, lines 39-42; col. 9, lines 18-47). Schultz et al. also teach the nanoparticles providing a unique SERS-signal that is correlated with the binding specificity of the probe of the nanoparticles (col. 5, lines 25-42; col. 14, lines 41-43; col. 14, lines 21-43).

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Regarding claims 3 and 4, Shultz et al. teach the SERS-enhancing nanoparticles comprising one or more Raman active tags of fluorescent dyes and nucleic acids (col. 3, lines 42-48) and at least one of the nanoparticles having a net charge (col. 30, lines 55-57).

With respect to claims 7-12, Shultz et al. teach nanoparticles being composite organic-inorganic nanoparticles comprising a core and a surface, wherein the core comprises a metallic colloid comprising a first metal and a Raman-active organic compound (col. 24, lines 44-50; col. 23, lines 35-48). Shultz et al. teach the COINs further comprising a second metal different from the first metal forming a layer over overlying the surface of the nanoparticles (silver shell and gold core, col. 23, lines 35-39) and further comprising an organic layer overlying the metal layer, which organic layer comprises a polynucleotide probe (col. 23, lines 40-48 and 54-61; col. 5, lines 60-67). Schultz et al. further teach at least some of the nanoparticles further comprising a fluorescent label that contributes to the optical signature (col. 23, lines 40-48).

Regarding claim 34, Shultz et al. teach a computer comprising an algorithm for analysis of the SERS signals obtained from the sample (col. 15, line 66-col. 16, line 4).

3. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Farquharson et al. (US 6,943,031) in view of Takagi et al. (US 4,654,132) further in view of Schultz et al. (US 6,180,415) and Mirkin et al. (US 2003/0211488).

Farquharson et al. in view of Takagi et al. further in view of Shultz et al., as applied to claim 1, teach a gel matrix comprising a nanoparticles with one or more Raman-active tags, but fail to teach the Raman-active tag comprising adenine.

Mirkin et al. teach a Raman-active tag being an analog of adenine, poly-adenine (par. 181), in order to utilizing a spectroscopic fingerprint in protein-protein screening.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to include in the solid gel matrix of Shultz et al., a

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nanoparticles comprising a Raman-active tag of an analog of adenine as taught by Mirkin et al., in order to provide increased sensitivity and specificity of detection of analyte.

Response to Arguments

4. Applicant's arguments with respect to claims 1-12, 33 and 34 have been considered but are moot in view of the new ground(s) of rejection. The previous rejections of these claims have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of applicant's amendment requiring the new limitation of the SERS-enhancing nanoparticles being stationary within the gel.

Conclusion

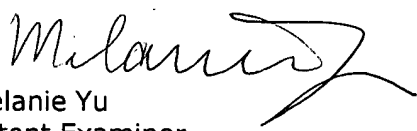
No claims are allowed.

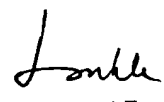
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie Yu whose telephone number is (571) 272-2933. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Melanie Yu
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Art Unit 1641


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